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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/501,155

07/13/2004

Koichiro Saga

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RADER FISHMAN & GRAUER PLLC
LION BUILDING
1233 20TH STREET N.W., SUITE 501
WASHINGTON, DC 20036

EXAMINER

WATSON, JOY L

ART UNIT

PAPER NUMBER

1792

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/501,155	Applicant(s) SAGA, KOICHIRO	
	Examiner JOY WATSON	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 and 42-53 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-36 and 42-53 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Claims 1-36 and 42-53 have been examined on the merits. Claims 37-41 have been cancelled.

Response to Arguments

2. Applicant's arguments, see page 11 and 12 of Remarks, filed April 3, 2008, with respect to the rejection(s) of claim(s) 1-3, 5, 8-14, 17-17, 19, 22-24, 26, 29-41 under 35 USC 102(b) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Vaartstra (US Patent 6,242,165 known hereafter as '165), Mullee et al. (US Patent 6,277,753 known hereafter as '753), Mullee (US Patent 6,306,564 known hereafter as '564) for Claims 1-36 and 42-53 as further explained below.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

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4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. Claim 1-3, 5, 15-17, 19, 22-24, 26, 29, 31-33, 35, 36, 42, 44-46, 48-50 and 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vaartstra (US Patent 6,242,165 known hereafter as '165) and further in view of Mullee et al. (US Patent 6,277,753 known hereafter as '753).

Claims 1, 29, 33, 42, 46 and 50

'165 teaches treating a surface (a semiconductor) with a supercritical fluid where NH_3 is a co-solvent (col. 4 lines 29-57, col. 11 Claim 15) and teaches that tailoring the additional components (concentration of co-solvents) that temperature and pressure are result effective variables (col. 5 lines 60-67, col. 6 lines 23-45). '165 does not teach the specific values for temperature and pressure nor the concentration range of ammonium hydroxide. '753 teaches cleaning a substrate with supercritical fluid a pressure range from 1050-6000 psi, temperature range from 20-70°C, and a concentration of ammonium hydroxide from 0.1-15 v/v% (col. 2 lines 50-67, col. 3 lines 1-10). Without evidence of predictable results it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate temperature, pressure and concentration of the supercritical fluid and ammonium hydroxide, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 15, 31, 35, 44, 48 and 52

'165 teaches treating a surface (a semiconductor) with a supercritical fluid where ammonium fluoride is a co-solvent (col. 4 lines 29-57, col. 6 lines 11-23) and teaches and that tailoring the additional components (concentration of co-solvents) that temperature and pressure are result effective variables (col. 5 lines 60-67, col. 6 lines 23-45). '165 does not teach the specific values for temperature and pressure nor the concentration range of ammonium hydroxide. '753 teaches cleaning a substrate with supercritical fluid a pressure range from 1050-6000 psi, temperature range from 20-70°C, and a concentration of ammonium hydroxide from 0.1-15 v/v% (col. 2 lines 50-67, col. 3 lines 1-10). Without evidence of predictable results it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate temperature, pressure and concentration of the supercritical fluid and ammonium hydroxide, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 22, 32, 36, 45, 49 and 53

'165 teaches treating a surface (a semiconductor) with a supercritical fluid where HF is a co-solvent (col. 4 lines 29-57, col. 6 lines 11-23) and teaches and that tailoring the additional components (concentration of co-solvents) that temperature and pressure are result effective variables (col. 5 lines 60-67, col. 6 lines 23-45). '165 does not teach the specific values for temperature and pressure nor the concentration range of ammonium

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hydroxide. '753 teaches cleaning a substrate with supercritical fluid a pressure range from 1050-6000 psi, temperature range from 20-70°C, and a concentration of ammonium hydroxide from 0.1-15 v/v% (col. 2 lines 50-67, col. 3 lines 1-10). Without evidence of predictable results it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate temperature, pressure and concentration of the supercritical fluid and ammonium hydroxide, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 2, 3, 16, 17, 23 and 24

'165 and '753 suggests the method according to Claim 1 and additionally teaches where the surface has a structural body and is a fine structural body with an electrode pattern (col. 4 lines 30-57).

Claim 5, 19 and 26

'165 and '753 suggests the method according to Claim 1 where the supercritical fluid is CO₂ (col. 4 lines 3-9).

6. Claim 8-14, 30 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullee (US Patent 6,306,564 known hereafter as '564).

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Claim 8, 12, 30, 34, 43, 47 and 51

'564 teaches a treating a surface (a semiconductor) with a supercritical fluid (CO₂) and diglycolamine (col. 2 lines 29-49, col. 5 claim 1) and teaches and the temperature is between 20-80°C, pressure is between 1050-6000 psi, and concentration of the diglycolamine is less than 15% volume (col. 6 Claims 3, 5 and 8). Without evidence of predictable results it would have been obvious to a person having ordinary skill in the art at the time the invention was made to determine the appropriate temperature, pressure and concentration of the supercritical fluid and ammonium hydroxide, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Claim 9, 10 and 11

'564 suggests the method according to Claim 8 and additionally teaches that the surface has a structural body with an electrode pattern used for a photolithographic process (col. 2 lines 29-49).

Claims 13 and 14

'564 suggests the method according to Claim 8. Additionally '564 teaches using a supercritical fluid to treat a surface and adding a polar surfactant material (isopropanol) (col. 4 lines 12-35).

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7. Claims 4, 6, 7, 18, 20, 21, 25, 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over '165 and '753 and as applied to claim 1 above, and further in view of Mullee (US Patent 6,306,564 known hereafter as '564).

Claim 4, 18 and 25

'165 and '753 suggests the method according to claim 2, but does not teach that the surface is a photomask utilized for lithography. '564 teaches using a supercritical fluid to treat the surface of photoresist used in a photolithographic process (col. 2 lines 29-49). That is, the method to treat a surface taught in '165 could be used to treat a surface of photoresist used in a photolithographic process as taught in '564. It would have been obvious to one of ordinary skill in the art at the time of the invention to use the method taught in '165 to treat a surface of photoresist used in a photolithographic process as taught in '564. Using the known technique of treating a surface with supercritical fluid and NH_3 of '165 would have been obvious to one of ordinary skill in the art.

Claim 6, 7, 20, 21, 27 and 28

'165 and '753 suggests the method according to Claim 1, but does not teach that the supercritical fluid is further added with a polar surfactant material. '564 teaches using a supercritical fluid to treat a surface and adding a polar surfactant material (isopropanol) (col. 4 lines 12-35). It would have been obvious to one of ordinary skill in the art to use a polar surfactant material as taught in '564 in the surface treatment method taught by

'165. Using the known technique of adding a polar surfactant material in treating a surface of '165 would have been obvious to one of ordinary skill in the art.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JOY WATSON whose telephone number is (571)270-1267. The examiner can normally be reached on 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Cleveland can be reached on 571-272-1418. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph L. Perrin/
Joseph L. Perrin, Ph.D.
Primary Examiner
Art Unit 1792

JLW